

SC186 WG4-WG1 Meeting Notes

July 21-25, 2003 at RTCA

Attendees:

Jonathan Hammer (MITRE CAASD)
Joel Wichgers (Rockwell Collins)
Steve Koczo (Rockwell Collins)
Jim Maynard (UPS-AT)
Michael Petri (FAA ACB-420)
Sheila Mariano (FAA AIR-130)
Tom Foster (TRIOS)
Larry Bachman (Johns Hopkins Applied Physics Lab)
Gene Wong (FAA AND-500)
Bob Hilb (UPS)
Jim Duke (ALPA)
Ron Jones (FAA)
Rick Stead (ARINC)
Stuart Searight (FAA WJHTC)
Andy Zeitlin (MITRE CAASD)
Bob Passman (FAA ACO)
Robert Duffer (FAA ACO)
Steve George (FAA ACO)
Gary Livak (FAA ACO)
Bob Manning (L3 Comm Analytics) – via phone
Dara Gibson (FAA ACO)
Roxaneh Chamblou (MITRE CAASD)
Bernauld Smith (Glider Association of America, SSA)
Bill Kaliardos (FAA Hdqtrs)
Bill Petruzel (FAA AFS)
Bill Tedford (DoD)

Action items are highlighted in RED in these notes.

Monday 7-21-03

0. Introductions and Agenda Overview

1. Review of Comments to ASA MASPS

Note: The following notes capture discussion and action items during the review session on comments. Refer to the actual documented 'Comment Log' for specifics on how comments were resolved.

Ron Jones' Comments

Comment M8 – Concerning Figures 2-7, 3-1, change signal input from ADS-B/TIS-B Receive Subsystems to TCAS to a dashed line. **Action – Update to dashed line, and add an annotation that captures / describes the intent of all the ASSAP to TCAS interfaces.**

S4 (Section 2.4.5.3.3.2 – page 52) part 1 – accepted.

S4 part 2 – concerning the note: Modified the note, also added a note (#15) to Table 2-3.

S5 – modified text and added a note per Stu’s recommendation. As part of this discussion (S5 b), it was noted that 3.1.2.3.1.5 is redundant to 3.1.5.1. Deleting 3.1.2.3.1.5 has a ripple effect in the document, e.g., STP section. **Action: Tom Foster to update / provide draft text in the document to eliminate / clarify the redundancy of these sections. Action includes revisiting Note 7 of Table 3-4.** Joel noted that we need to be cautious on how we treat Time of Applicability of Measurement and Time of Applicability of Reception. Latency on transmit time is another issue. Tom’s action to resolve clarify these issues. Action completed (see notes on Wednesday part of mtg).

M2 – agreed to.

M3- minor edits to suggest paragraph, then agreed to.

M6 – used Ken Carpenter’s suggested wording. Also covers E-112.

M7 – E130, E-115 – Used Ken’s wording.

M17 – Ron noted the following concerning ‘coast time’. To many people, coasting implies a lack of received data, which then requires data extrapolation to continue the surveillance data. On the other hand, interpolation between 4.8 sec radar updates is not coasting per this definition. Would not want to transmit ‘filler’ data between sensor updates.

This is a definition issue – Maximum Data Age in Table 2-3, item 17. **Action: Refine definitions of ‘coast time’, ‘data age’ and ‘data extrapolation’ (section 2.4.5.3.3.5) and scrub / review the document for proper use of these terms.**

M20 – discussion about TIS-B latency. Generally, it is desirable to provide track uplinks by TIS-B based on new track updates, i.e., due to measurements. Alternately, TIS-B uplinks could be based on ‘fused’ data from a multiple ground sensors. Latency management for both those approaches were discussed. **Action – Jonathan to draft a counter proposal to Ron’s inputs based on the group’s discussion.**

M24, also addresses M25. - Concerning Table 3-4; concerning the requirement for geometric altitude. Recommendation is to make Geo Altitude and Geo Altitude Rate ‘Desired’ for TQL 1, and 2; added a note (Note 10 in Table 3-4 that Geo Altitude is required for NACp ≥ 9 or NIC ≥ 9 , except on surface. {DO-242A requires to xmt both baro and geo altitude if available}. Further expanded Note 10 to include ‘Mode C qualify for this’...

M27 – BAQ a requirement or optional. Added a note (Note 10 in Table 3.1-4) indicating that current applications do not impose any requirements on BAQ, thus it is set to zero for now. Also expanded Note 14 in Table 2-3: “it is assumed that aircraft transmitting Mode C qualify for this requirement for altitude if SIL_{baro} and BAQ are not transmitted or are unknown.

M28 – SIL_{baro} . Added a note indicating that current applications do not impose any requirements on SIL_{baro} , thus it is set to zero for now

M29 – ASA version numbers. ASA version number shall be discernable. Messages transmitted need to be traceable to this MASPS.

M30 - 3.1.5 and subsections. ACL not required to be transmitted. If transmitted, ACL=0.

M31 – “Locally unique address”. Ron’s wording was accepted.

M32 – ASA-specific installation information (also see M29) – deleted ASA version # in list of 3.1.5.24 and added a note tying it to DO-242A capability codes.

M33 – Update rate in operation environment. Accepted recommended text.

M35 – TIS-B on airport surface. Added a note that TIS-B may transmit all known surface targets in part or all of an airport movement area in order to enhance coverage.

M37 – Table 3-15 – Added a note.

M40 – Table 3-18 (also M37) – Added a note.

WG#2 Comments:

M9 – Already corrected

M15 – Coverage volume. Made edits concerning air-air coverage / update rate.

M16 – Edited latency paragraph.

M17 already taken care of when reviewing Ron’s comment.

M18 – Andy, B2 is the time the radar presents its measurement. A2 is the time of measurement by the radar.

M19- CD2 versus ASTERIX interfaces comment.

M22 – OK after discussion.

M23 – OK after discussion.

M34 – OK after discussion.

M39 – OK after discussion.

Starting at top of consolidated comment list:

S1 – Step 1, moved suggested paragraph to after the 1st paragraph in 1.2.4.4. Step 2, will consider adding a Section 4 with cross-referencing of ASA requirements to the various MASPS and MOPS. Should be done at the very end.

Tuesday 7-22-03

S2 – Agreed to the changes recommended. Group should review these changes to ensure proper flow / organization of text.

S3 – Some mismatching in the parameters between section 2.4 requirements tables and the requirement summary tables in the appendices. **Action – Review and identify inconsistencies between application requirements tables and requirements tables in Section 2. Actions fall on Joel for ASSA, FAROA; Jonathan for EVAcq, EVApp, ASIA; Michael for CD and ACM, Steve K for ICSPA. Complete this by Wednesday AM.**

Larry – commented on 1) confidence level on update interval, and 2) coverage volume (e.g., altitude) parameters requirements. Need justification for these.

S6 – Concerning an integrated TCAS / CDTI display. Tom F. indicated that we need some high-level MASPS requirements. **Action - Tom, Jim M., Bob H., Randy B., Andy Z. to work this in a breakout session and provided text.** The breakout session later provided proposed text for Section 3.3.4.

There was considerable discussion about whether a ‘shall’ or ‘should’ is needed for displaying TCAS symbology and display requirements per DO-185A in the event of a TA or RA. FAA AIR (Steve George) indicated the need for a ‘shall’. Other views recommended the use of ‘should’, allowing the possibility for alternate display approaches for an integrated TCAS / CDTI display that may offer improved symbology. It was noted that this would then require future modification to DO-185A.

S7 – part of S6.

M10 – taken care off by S2.

M11 – added some minor edits. Accepted.

M1 – Altitude integrity issue. Do we need to have better altitude data? Currently there is no basis for additional requirements. ASA MASPS provides the structure for better altitude data, but has no current requirements.

M4 – Remotely operated CDTI. We have no such requirement at this time. No further discussion.

M8 – Decided to use the PO-ASAS categories. **Michael action to update and scrub document for the PO ASAS Categories.**

M14 – Independence of Nav and Surv. Tom’s concerns have been addressed in our analyses. May need to consider this further for GSA. **Action – examine the ASA applications to which this applies and ensure that this notion of common mode failure has been addressed adequately is stated in the text.**

M12 – Consider adding a note that indicates our rationale for ordering applications in ACL.

M13 - Added a row in Table 2-3 that specifies a minimum TQL to be transmitted for each application. Added Note 16.

M21 – Yes, ACM could be part of ROA. Current ACM application description does not consider ROA. There is no such requirement in current MASPS.

M26 – Age of data parameter. Updated section 3.1.5.2. Joel offered some new text. **Action – need to clarify ‘age of data’, ‘data age’, ‘latency’. The group decided to use latency, and not use the term ‘data age’ in place of latency.** Review document and scrub. Accepted.

M36 – Accepted requested changes.

M38 – Accepted change.

M41- Left as is. Agreed

M42 – Editorial: Make Tables 3-18 and 3-19 consistent in appearance. **WG1 Action - create separate tables that map CDTI requirements for each of the ASA applications for the individual appendices.** Use Table 3-19 as a composite of these individual tables.

M43 – Addressed.

M44 – minor edits. Accepted/

M45 –Addressed.

M46 – Done.

M47 – Done.

M48 – Concerning training. Not part of MASPS effort. More in line with an Advisory Circular. **Action “training requirements are outside the scope of this MASPS” – put this in Appendix B.**

M49 – Accepted. Jonathan action to update.

M50 – Accepted.

M51 – Accepted.

M52 – Added some text – Jonathan action to make some additional edits to improve.
Accepted.

M53 – Addressed by Ron Jones’ Coast clarification suggestion.

M54 – WG4 disagrees. Further clarifications have been made to Section 2.2. Action for Tom Foster to contact Tom Pagano to discuss this further.

M55 – Accepted.

M56 – Deleted paragraph and table entry concerning the ‘limit of 10 aircraft’. **Action to scrub the document for the ‘CDTI limit of 10 aircraft’.** We have a general requirement of a minimum number of 30 targets.

M57 – Lee action to correct the inconsistencies in Table 7 Summary of IFR Fault Tree Safety Analysis per his recommendation.

M58 – Lee action to update as per his recommendation.

Ken Carpenter’s (KC) Comments

KC #29 – Add a note in that there is a philosophy / requirement of an A/V transmitting equivalent TQL commensurate to the ACL’s/application being supported on own-ship.
Joel action to update the note.

KC 30 – added a parenthetical statement.

KC31 – It was added to inform the other aircraft’s ACM that own aircraft has an operational TCAS.

KC32- Need to discuss this with Bob Hilb.

Tony Warren (TW) Comments:

TW #2 – made edits to address comments.

TW6 – edits address the comment.

TW7 – accepted. **Stu action to update Figure 2-9 to reflect change.**

TW10 – provided edits to address comments.

Wednesday 7-23-03

One more of Tony Warren's (TW) M comments:

Two Actions: Tom Foster – 1) place a reference to Tom's appendix where we reference TQL; 2) validate that it can be assumed the DO-242 and DO-242 A equipment has a TQL = 1.

Tom F. - provided STP Action that talks about time of applicability (Section 3.1.2.3.1.5). Tom provided text that was approved.

Joel W. – provided text for Action Item #18.

Stu provided text for Section 3.1.1. on TQL.

TW11 – Updated Table 2-3 to clarify.

Review of AIR Comments:

AIR1- Agreed.

AIR2 – Concerning format / structure of the analysis and relationship to DO-264/FAA System Safety Handbook. Inconsistencies among the appendices. Appendix B needs to be softened. It's a matter of organization between Apps Descriptions and OSEDs. Some things are lacking in Apps Descriptions, such as ATC procedures. For this version of the MASPS, WG can only accommodate the comments by adding a note in appendix B that indicates that we generally tried to adhere to the process, but are breaking new ground. This will need to be more rigorous in the next version of the MASPS. **Jonathan action to revise Appendix B to address the concerns raised.** Will look at the appendices if we can make any improvements, but this will need to be addressed in the next version of the MASPS.

AIR5 – Change title of Section 2.3 to Hazard Analysis for Appendix D. **Action Item for ???**

AIR 6 – Appendix E. Cannot have a collision when A/Vs are stationary, but failure to properly setup the application could result in a latent failure condition which could lead to a hazard / consequence later. Discussion about the approach to doing the hazard analysis in this way. **Joel action to confirm that there are notes in Appendix E related to the methodology of latent failures used in this appendix; also add caution note to advise applicants to check with the ACOs for acceptance of the hazard analysis methodology when undertaking future certifications of this application.**

AIR 7 – same comment for Appendix F as in AIR 6 for Appendix E. **Same action for Joel as for AIR6 comment on Appendix E.**

AIR 8 – Concerning EV Approach. **Action concerning all the appendices to add notes in each of the appendices indicating the intent of the analysis as it relates to the OSED, OHA, etc. process using the DO-264 / ED78A methodology.**

AIR 9 – Concerning ACM. Agreed to keep in document. Need some future correlation of interaction / compatibility between ACM and evolving ATC decision support tools. Discussion about intent information, including A/V intent, ATC intent, etc. **Recommend adding a note that these are concept that require additional maturation. Action – add this note at the beginning to all of the probing analyses.**

Bob Hilb's (BH) Comments:

BH1 – Concerning separate TCAS / CDTI displays. Added a note.

BH 1.2.4.3. Added a note. Bob not fully satisfied. Will address it at the plenary.

BH 5 – made edit to address comment.

BH6 – OBE

BH7 – Addressed by changes already made.

BH8 – Changed to forward field of view.

BH10 – withdrawn.

Rip Torn (RT) Comments:

RT1 – added 4D.

RT2- Comment considered, not appropriate for this section.

RT3 – Added some words to consider pilot role.

RT4 – not clear of the attend. No action taken. NIC , NAC already addresses this.

RT5- Clarified heading title.

RT7- Text is being revised. Will consider crew workload as a comment.

RT8- Plenary directed WG4 that security will not be a focus of this initial MASPS.

RT9 – Same comment as RT8.

RT10 – to be addressed at MOPS level.

Chris Moody (CM) Comments:

CM4 – Don't know how to consider RAIM hole. SILbaro is not needed as a predictor; real time value is sufficient. SILbaro is not expected to change.

CM6 – transmission of geo and baro altitude (both, simultaneously?). **Tom Foster action to develop a proposal for transmission requirements for geo and baro.**

CM9 – Yes, must do that.

CM10 – Table does not imply that P and V are both needed, neither does the associated text.

Tim Rand (TR) Comments:

TR1 – Change accepted.

TR2 – Not sure how we can deal with this in current avionics.

TR3 – Need both baro and geo, not just baro. Leave as is.

TR4 – We picked 1000 ft for consistency with EVAcq (hierarchy of ACLs), added a note.

Completed review of ‘S’ and ‘M’ Comments

Planning Discussion – For Thursday, plan review of Appendices AC and the new AD. Meet at Rockwell Collins’ Rosslyn office.

Roxinae’s Proposal on TIS-B latency

Brief overview provided.

Thursday 7-24-03

Agenda – Tom’s action item on baro / geo altitude requirements. Review of editorial comments.. Appendix reviews of AC, etc.

Tom’s action on baro/geo altitude

Discussed and accepted after some minor modifications.

Back to review Editorial Comments

Reviewed editorial comments until lunch.

Review of Appendix AE - Radar Like Services GSA

Chris Moody and Stan Jones led the review discussion for this appendix.

Feedback to Chris and Stan was to consider SIL’s of 10^{-3} , 10^{-4} , 10^{-5} , 10^{-7} , for a range of NAC_p and NIC values.

Chris and Stan will have appendix ready by Friday, Aug 1.

Review of Appendix AC - Radar Like Services GSA

Jim Maynard requested for inputs to the appendix by Wednesday, July 30. Jim will then have it ready by Friday, Aug 1.

Action item – Joel W. to provide Jim with references from FAA documents on GPS measured data.

Summary of Action Items

- 1) Action on M8– Update Figures 2-7 and 3-1 to a dashed line for the ADS-B/TIS-B Receiver to TCAS path. Add an annotation that captures / describes the intent of all the ASSAP to TCAS interfaces.
- 2) Action on S5: (Modified text and added a note per Stu’s recommendation. As part of this discussion (S5 b), it was noted that 3.1.2.3.1.5 is redundant to 3.1.5.1). Deleting 3.1.2.3.1.5 has a ripple effect in the document, e.g., STP section. **Tom Foster** to update / provide draft text in the document to eliminate / clarify the redundancy of these sections. Action includes revisiting Note 7 of Table 3-4 (ensure the Note 7 points to the right section). Action completed – see part of notes on Wed.

- 3) Action M17: Drafting Subgroup - refine definitions of 'coast time', 'data age' and 'data extrapolation' (section 2.4.5.3.3.5) and scrub / review the document for proper use of these terms.
- 4) Action on M20 – Jonathan to draft a counter proposal to Ron's inputs based on the group's discussion on the two TIS-B configurations / options.
- 5) Action on S3 – Review and identify inconsistencies between application requirements tables and requirements tables in Section 2. Actions fall on Joel for ASSA, FAROA; Jonathan for EVAcq, EVApp, ASIA; Michael for CD and ACM, Steve K for ICSPA. Complete this by Wednesday AM.
- 6) Action concerning S6 - Tom, Jim M., Bob H., Randy B., Andy Z. to work requirements text for Section 3.3.3 concerning an integrated TCAS/CDTI display requirements in a breakout session and provided text. Completed and accepted.
- 7) Action on M8 - Michael action to update and scrub document for the PO ASAS Categories.
- 8) Action on M14 – Concerning Nav and Surv common mode failures. Examine the ASA applications to which this applies and ensure that this notion of common mode failure has been addressed adequately in the stated text.
- 9) Action on M26 – need to clarify 'age of data', 'data age', 'latency'. The group decided to use latency, and not use the term 'data age' in place of latency. Review document and scrub.
- 10) WG1 Action on M42 - create separate tables that map CDTI requirements for each of the ASA applications, for inclusion in each of the individual appendices. Table 3-19 serves as a composite of these individual tables.
- 11) Editorial action to scrub document now that Appendix AD has been deleted.
- 12) Action on M48. Add "training requirements are outside the scope of this MASPS" – put this in Appendix B.
- 13) Action on M48 – Add text on "training requirements are outside the scope of this MASPS" – put this in Appendix B.
- 14) Action on M49 –Jonathan to update Figure 1-1 to make ADS-B signal paths into two arrows to reflect broadcast mode.
- 15) Action on M52 – Added some text – Jonathan to make some additional edits to improve tie in to ED78A/DO-264.
- 16) Action on M56 – Deleted paragraph and table entry concerning the 'limit of 10 aircraft'. Action to scrub the document for the 'CDTI limit of 10 aircraft'. We have a general requirement of a minimum number of 30 targets. Make consistent in document.
- 17) Action on M57 – Lee action to correct the inconsistencies in Table 7 Summary of IFR Fault Tree Safety Analysis per his recommendation.
- 18) Action on M58 – Lee action to update as per his recommendation.

- 19) Action on KC#29 – Joel W. action to add a note ‘that there is a philosophical requirement that an A/V transmits an equivalent TQL commensurate to the ACL’s/application being supported on own-ship. Joel action to update the note. Completed.
- 20) Stu action on TW7 - to update Figure 2-9 to reflect change.
- 21) Two Actions: Tom Foster to 1) place a reference to Tom’s appendix where we reference TQL; 2) validate that it can be assumed the DO-242 and DO-242 A equipment has a TQL = 1.
- 22) Action on AIR2 – Concerning format / structure of the analysis and relationship to DO-264/FAA System Safety Handbook. Inconsistencies among the appendices. Appendix B needs to be softened. It’s a matter of organization between Apps Descriptions and OSEDs. Some things are lacking in Apps Descriptions, such as ATC procedures. For this version of the MASPS, WG can only accommodate the comments by adding a note in appendix B that indicates that we generally tried to adhere to the process, but are breaking new ground. This will need to be more rigorous in the next version of the MASPS. Jonathan action to revise Appendix B to address the concerns raised. Examine the appendices to see if we can make any improvements at this point; but this will need to be addressed in the next version of the MASPS.
- 23) Action concerning AIR5 – Change title of Section 2.3 to Hazard Analysis for Appendix D. Action item for ???
- 24) Action concerning AIR 6 – Appendix E. Cannot have a collision when A/Vs are stationary, but failure to properly setup the application could result in a latent failure condition which could lead to a hazard / consequence later. Discussion about the approach to doing the hazard analysis in this way. **Joel action to confirm that there are notes in Appendix E related to the methodology of latent failures used in this appendix; also add caution note to advise applicants to check with the ACOs for acceptance of the hazard analysis methodology when undertaking future certifications of this application**
- 25) Action concerning AIR 7 – same as action 24, but related to Appendix. Same action for Joel as for AIR6 comment on Appendix E.
- 26) Action on AIR 8 – Concerning EV Approach. **Action concerning all the appendices to add notes in each of the appendices indicating the intent of the analysis as it relates to the OSED, OHA, etc. process using the DO-264 / ED78A methodology.**
- 27) Action on AIR 9 – Concerning ACM. Agreed to keep in document. Need some future correlation of interaction / compatibility between ACM and evolving ATC decision support tools. Discussion about intent information, including A/V intent, ATC intent, etc. **Recommend adding a note that these are concept that require additional maturation. Action – add this note at the beginning to all of the probing analyses.**

- 28) Action on CM6 – transmission of geo and baro altitude (both, simultaneously?). Tom Foster action to develop a proposal for transmission requirements for geo and baro altitude.
- 29) Action item – Joel W. to provide Jim with references from FAA documents on GPS measured data.

Future WG4 Meetings, Dates of Interest

August 1 Document mail out for Final Review and Comment.

Comments due ~Sept 1

WG4 Meeting to address FRAC comments Sept. 15-17

SC-186 Plenary Sept. 18-19.

End of meeting notes